



International Scan on Asset Management: *Australia, Canada, England, and New Zealand*

April 8-April 23, 2005

Purpose

Investigate best case examples of asset management techniques and processes in the world...and identify lessons and applications for the U.S.

Sponsored by AASHTO, FHWA, and NCHRP

Where we went....



What were the drivers for adopting asset management approaches?

- Limited resources
- Increasing demands on and use of existing infrastructure
- Desire for credibility with elected officials and the public, that is, linking funding to system performance
- Where private provision of services was used, asset management was a way of providing strategic oversight

- Natural evolution in the development of individual infrastructure management systems
- Desire to evolve to a system that allows trade-offs among different asset categories and between asset strategies
- Legislative or governmental mandate, e.g.,
 - Road Management Act in Victoria
 - Local Transport Plan 2 guidance in England
 - Local Government Act in New Zealand

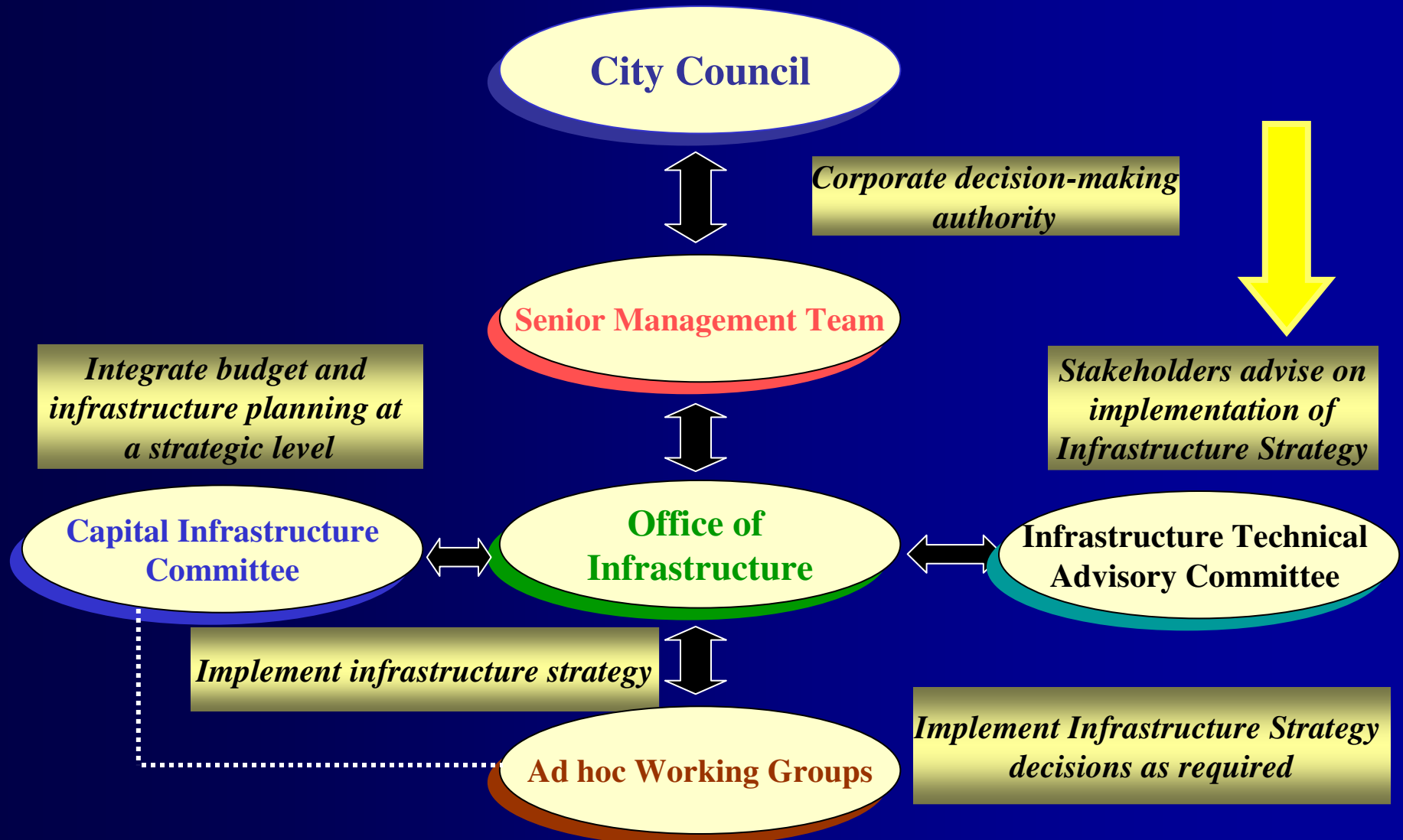
What we found...

Each site visited has made a long term commitment to, and allocated resources for, developing an asset management program....

and are continuing to “evolve” this program in response to agency decision-making needs.

Many agencies and/or jurisdictions
have set up an organizational support
structure for asset management....

Infrastructure Management Approach in Edmonton



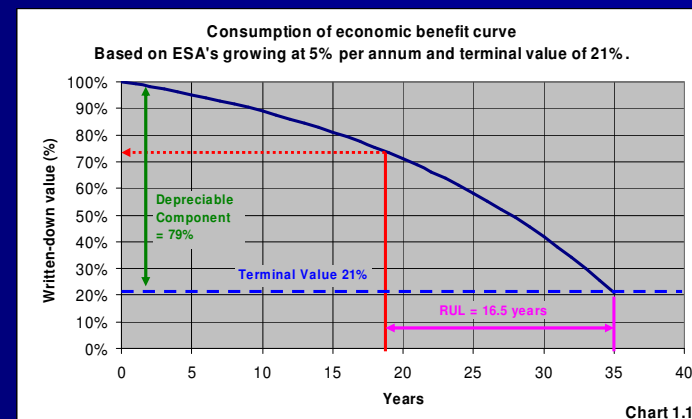
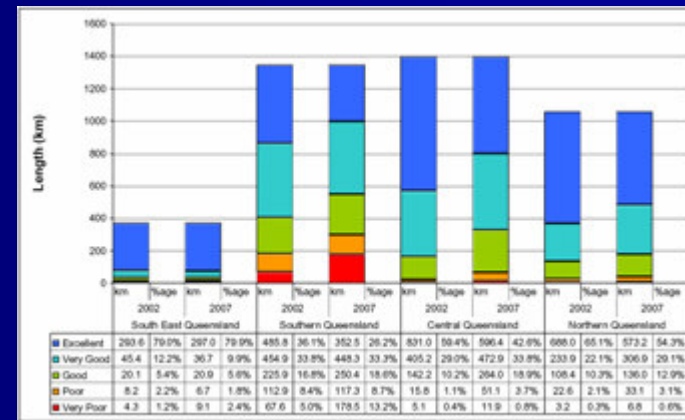
Asset management has been integrated into many corporate or agency planning and policy documents, and thus is related to decision making in different levels of an organization

for example....

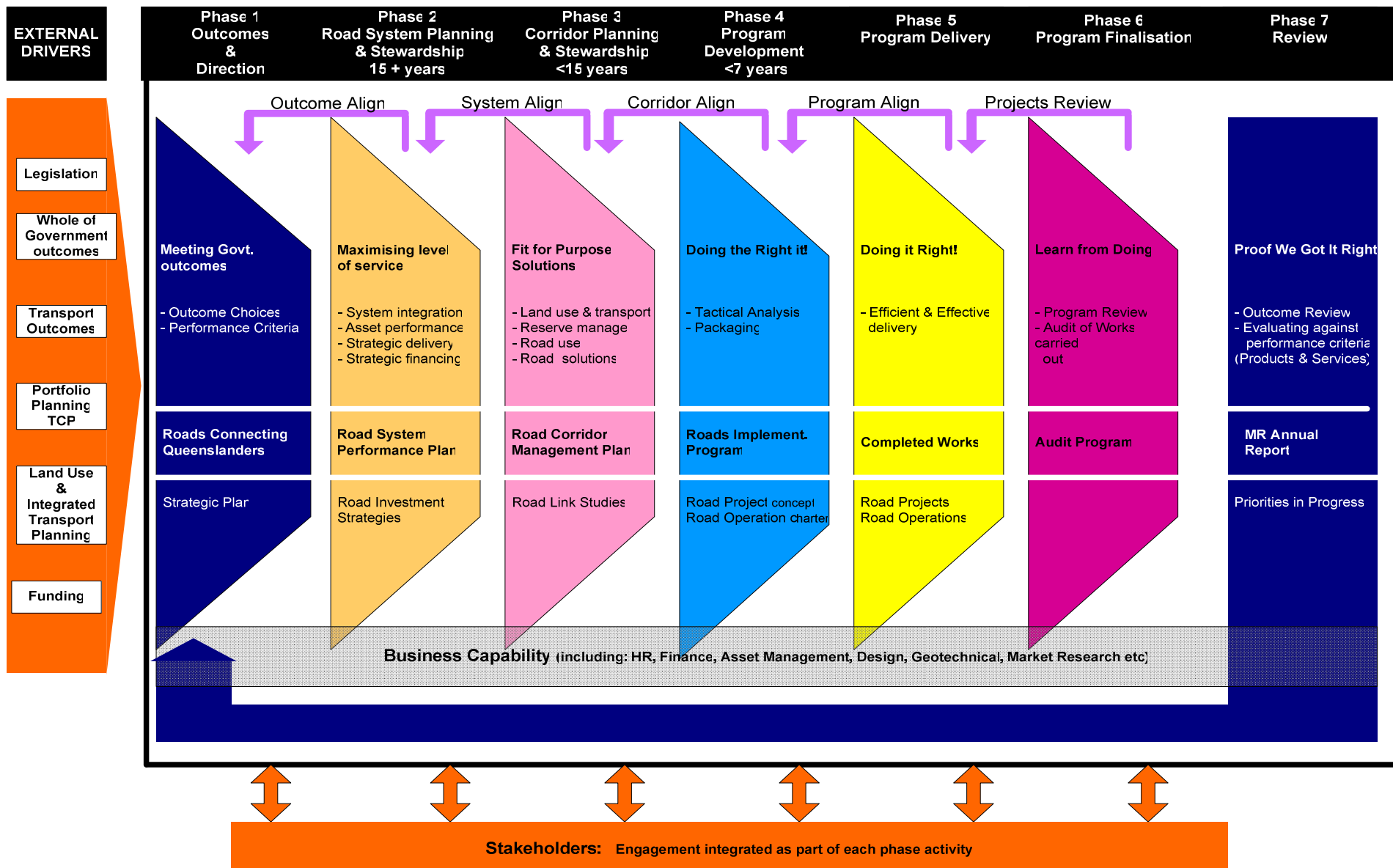
Queensland's Business

Decision-making Needs--Corporate level

- Road condition performance reporting
- Network asset investment studies
- Corridor planning
- Asset valuation



STRATEGIC FRAMEWORK FOR ROAD SYSTEM ASSET MANAGEMENT



Key performance measures and indicators provided a critical point of departure and an accountability reference for asset management programs

Performance Measures in Alberta

- Three key measures
 - Condition
 - Utilization
 - Functionality
- Common framework across infrastructure types
- Ministries develop specific measures

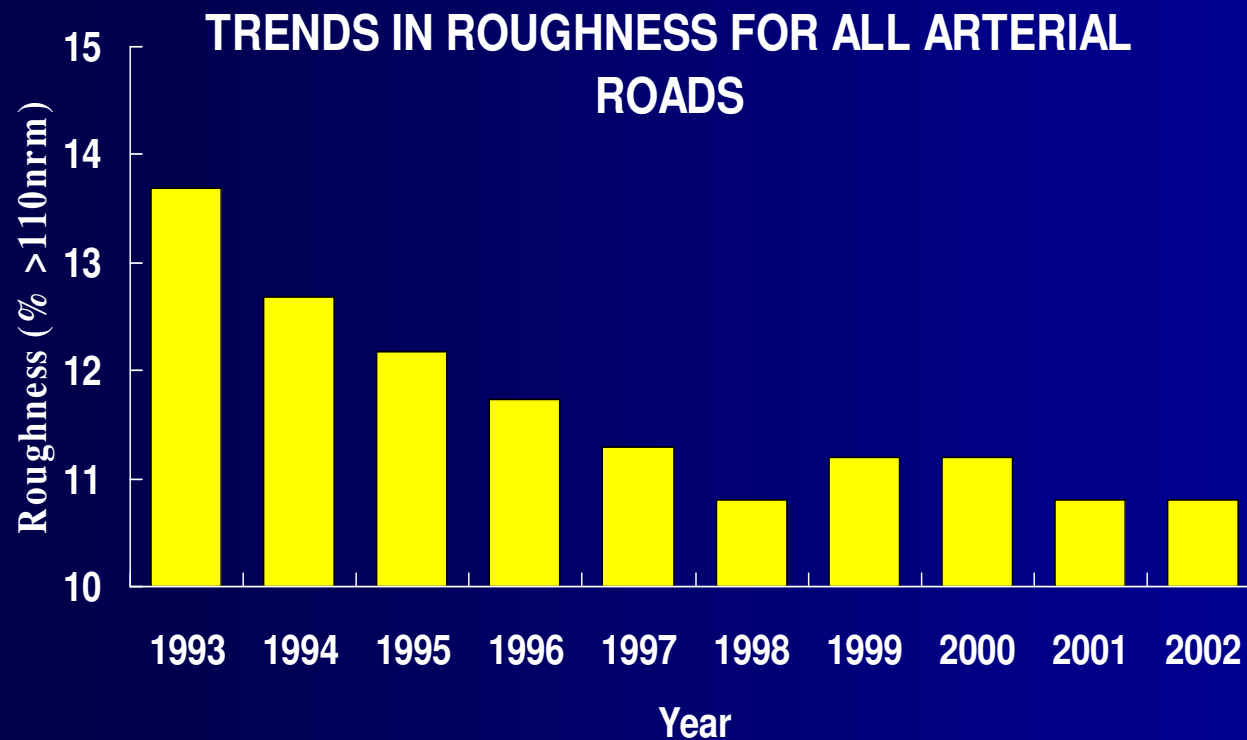


In New Zealand....

- Performance is measured in both absolute terms and in the reporting of trends
- Key measures are identified in the Statement of Intent and reported in the Annual Plan
- Long term asset management planning is significantly influenced by achievement of the performance measures, but is also strongly influenced by whole of life costs, just-in-time intervention and deterioration modelling.

Pavement roughness was a key performance measure almost everywhere

Pavement inventory and condition report in Victoria



In some cases, asset management plans have been developed or are in the process of being developed

Asset Management Plan in New Zealand -Key Components

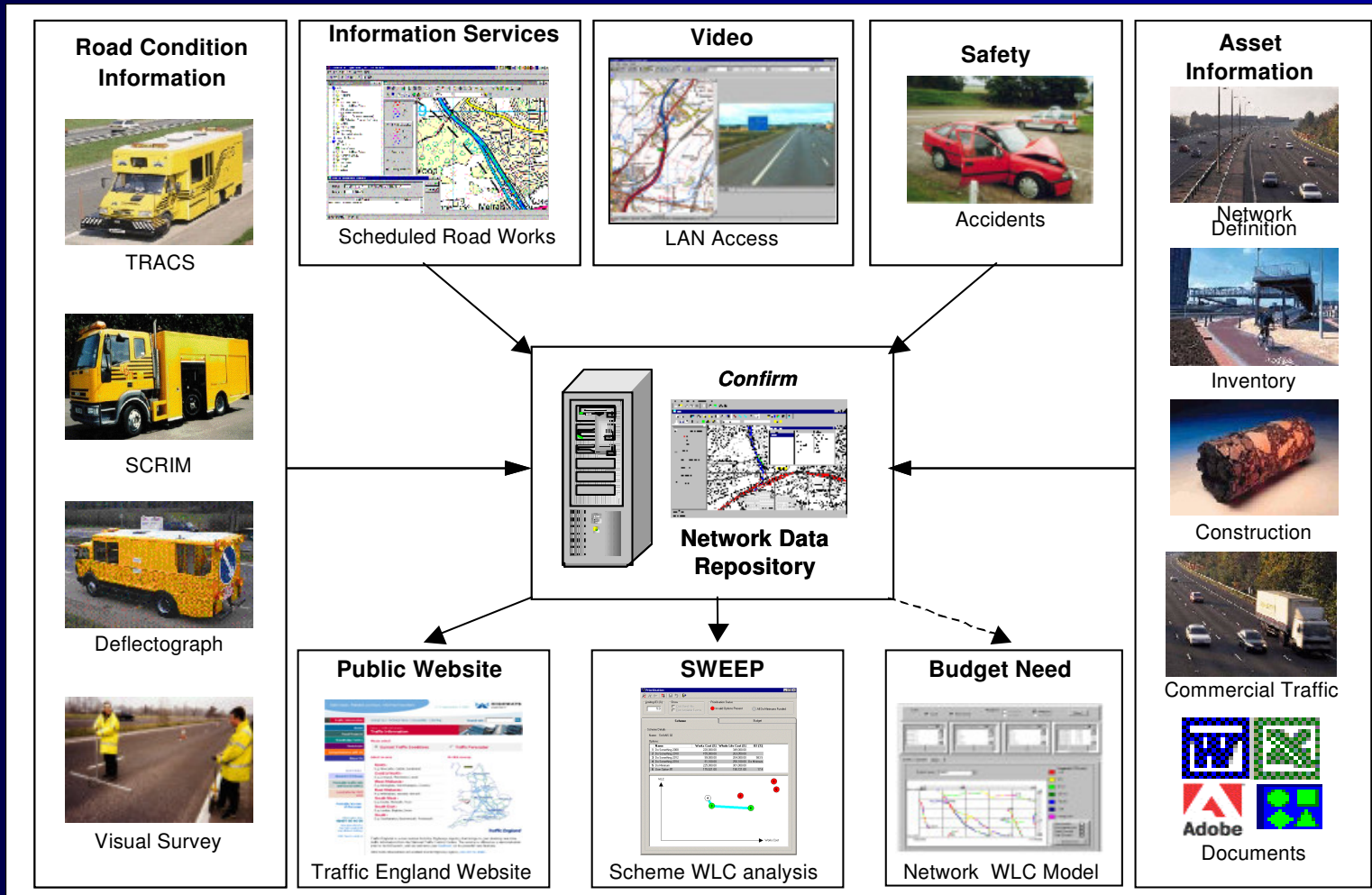
- Introduction and plan objectives
- Levels of service and performance standards
- Asset management business practices
- Asset portfolio description (inventory, condition, performance)
- Future demand and growth
- Risk management

Key Components, cont'd

- Lifecycle management
 - Operations, maintenance, renewals, capital, disposals
 - Structural and corridor
- Financial summary
 - Cash flow forecasts
 - Valuation and decline in service potential forecasts
- Plan improvement, review and monitoring

Infrastructure management systems were in widespread use, but in most cases they were stand-alone systems linked with a locational referencing system

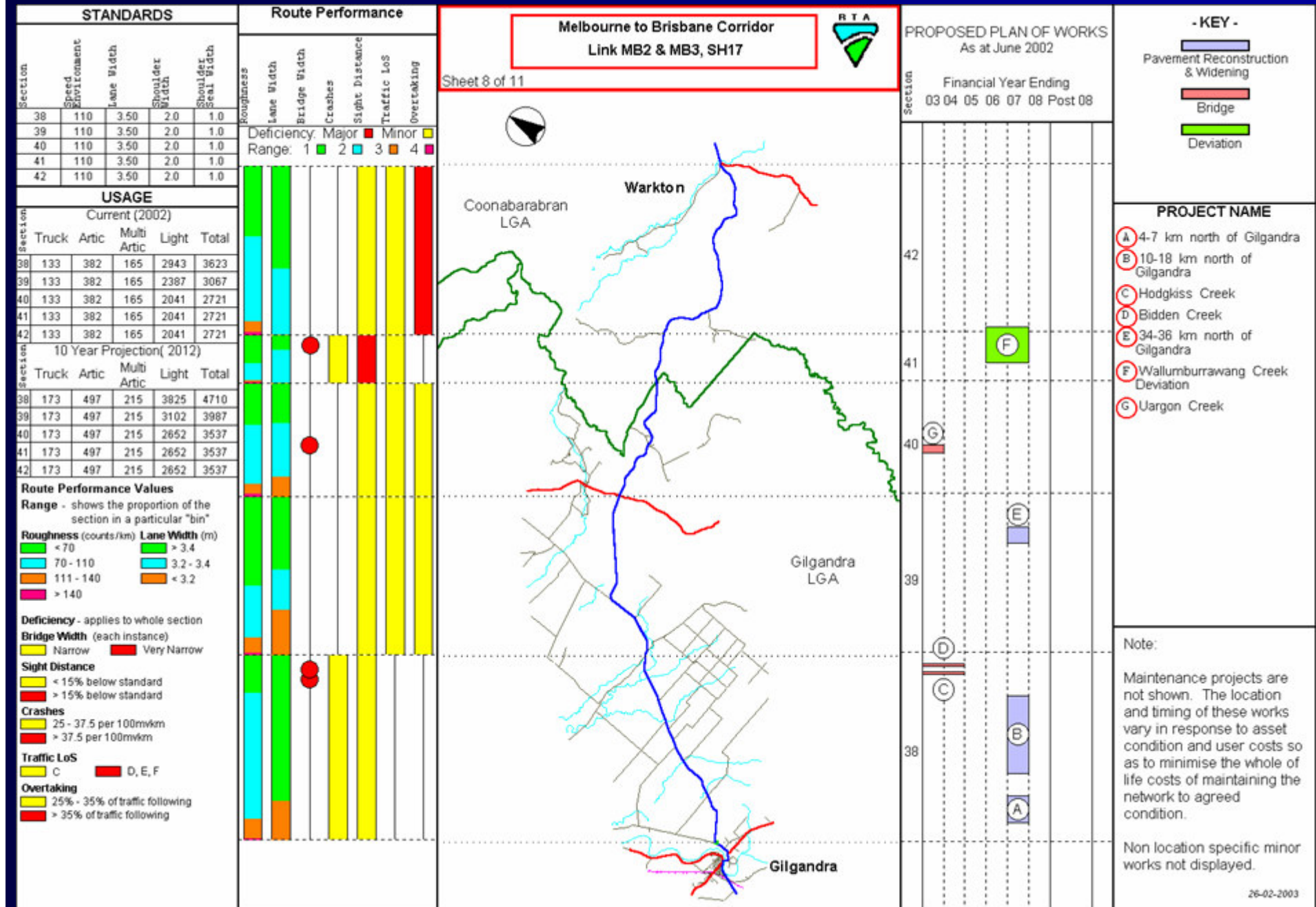
Highways Agency Pavement Management System Overview



**These information systems produce
a wide range of useful information**

**Some no more than basic inventory
data, while others can produce
performance and condition
reports....for example**

Use of Asset Data in New South Wales



Similar to the U.S., data is collected on a data collection schedule, but it seems that in most cases a lot more data is collected than what is typical in the U.S.

Approaches to Technical Analysis

In only a few cases was any effort made to conduct analysis-driven trade-off assessments; those that did were heavily based on engineering judgement.

However, it was clear that all of the agencies were working toward such a capability.

Ranking Example From Victoria

- Rehabilitation formula = $R * T * L * D / C$
 - R is % roughness > target level
 - T is traffic
 - L is life of treatment
 - D is rate of deterioration
 - C is unit cost of treatment
- Statewide ranking of individual projects to a defined budget
- Crude consideration of life cycle costs

Project Prioritization--Alberta

Infrastructure Requirements

Provincial Highways

Health Facilities/Equip.

School Facilities/Equip.

Post-Secondary Facilities

Water and Wastewater

Community Facilities

Housing

Other Infrastructure

Prioritization Criteria

Program Delivery

Infrastructure
Performance

Economic Benefits

Cost Avoidance/Saving

Cost-Effectiveness

Strategic Alignment

Cross-government Priorities

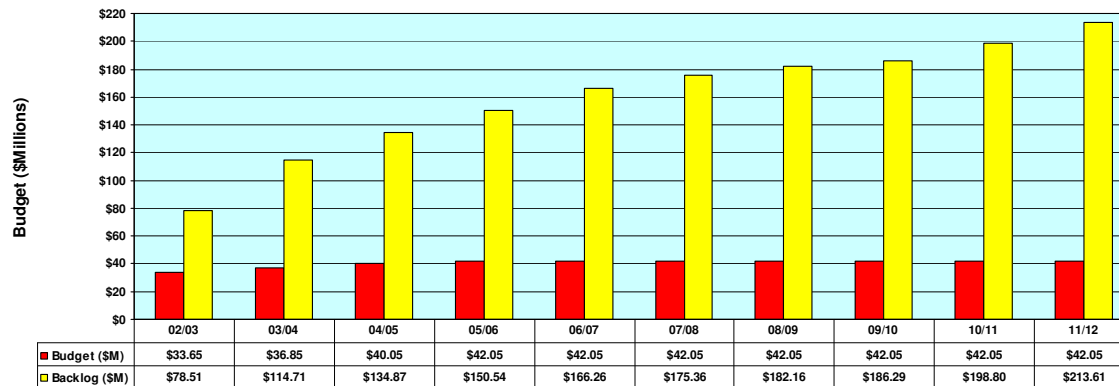
Prioritized Project
List

Scenario Analysis

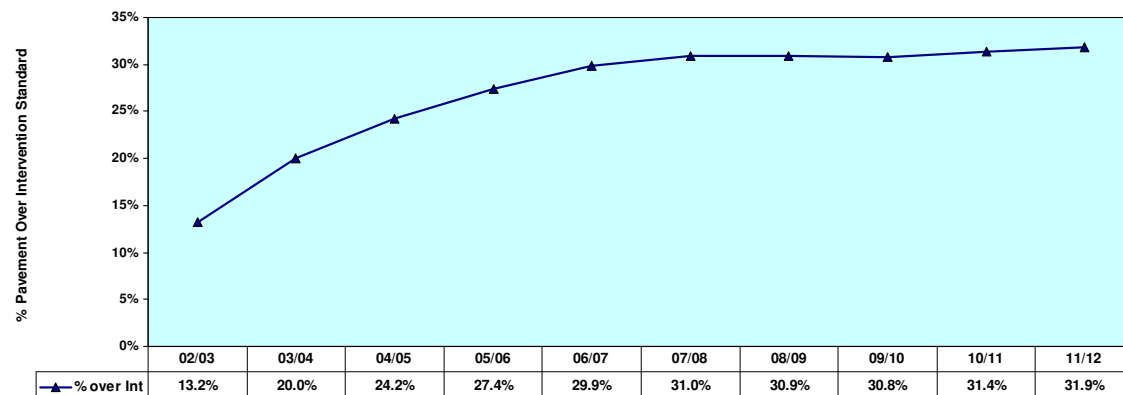
Several agencies used deterioration values and assumptions to conduct scenario analyses for future investment needs

“Maintain 2005/06 Funding Level Out to 10 Years” Scenario--Brisbane

Total Network - all Traffic Densities



Total Network - all Traffic Densities



Life cycle costing (also known as “whole-of-life” costing) has been adopted in each site as the basic approach toward program and project costing. Importantly, data identification and collection were targeted to support this approach.

Risk assessment was used by all of the agencies in their asset management program.

Not surprisingly, the risk assessment associated with a concessionaire's participation in a public-private partnership related to those factors that affected revenue generation, while that for public services tended to be related to factors of safety, public support and customer services.

Risk assessment was also used as a way of educating and obtaining asset management buy-in from elected officials.

The scan team's sense is that all of the sites visited have better formalized applications of risk and apply them in asset management much more than in the U.S.

Efforts have been made in each case to reach out to public officials, stakeholders and, in some cases, to the general public, in conveying the importance of an asset management policy.

National Asset Management (NAMS)

Steering Group

- Formed in 1995
- To further asset management best practice and knowledge within the New Zealand local government sector
- Not for profit organisation
- Activities
 - Publications
 - Training
 - Advancement of asset management



Lessons for the U.S.

Asset management programs have been used successfully to justify transportation funding (even in tight economic times) and to convey to decision makers that the investment is being delivered in the most cost effective manner possible.

Asset management programs have helped transportation agencies focus on network performance and to identify the best “value for dollar” of limited investment resources.

Adopting an asset management approach in an organization does not mean that everything has to change.

Asset management efforts are data-driven. However, developing an asset management culture in an organization does not have to await the many years it might take to develop database information systems.

Creating asset manager positions or at least assigning responsibilities for the asset management function are important foundations for an effective management program

Asset management efforts are best achieved when they are linked to strategic goals and desired outcomes.

All of the asset management programs used the concept of risk for establishing investment priorities.

Risk concepts need to be incorporated more systematically into U.S. asset management efforts.

Condition and remaining asset value are important indicators of the degree of need and level of service that are associated with different asset types....

Asset management systems are much more appropriate to use for asset valuation than straight-line depreciation accounting rules.

The integration of asset management concepts into public/private partnership agreements was an important challenge facing transportation officials....

a comprehensive asset management effort needs be part of any agreement in order to ensure the asset being returned to the owner in good condition.

Prior to contracting out core services, performance-based management systems should be in place that allows the infrastructure owner to know what levels of service are required. This was described in the scan as being a “knowledgeable owner.”

Data should have a clear purpose and be directly related to asset management decision making. Data collection costs should be tracked and data itself treated as an asset, with the same design, build, operate, maintain and life cycle cost analysis as is used for other assets.

Trade-off analysis techniques are more complex than simply assessing priorities within one asset category. The scan team did not find any case where technically-based cross asset trade-off tools were used. This is an important area for further development in the U.S.

Cross-functional teams, consisting of engineers, finance analysts, operations staff, and communications experts can best understand the many different aspects of asset management, such as data collection, developing strategies, and quality assurance.

The most impressive asset management programs had a strong human resource element.

Several agency personnel systems have created job positions with asset management in the job responsibilities

Asset management training for all levels of transportation officials is an important initiative for changing the culture of an organization and in establishing asset management expectations among key stakeholders.

Finally, it is important to understand the benefits of asset management programs, as articulated by those who have been using them for many years....

In sum....

It is clear that asset management as an organizational culture, a “business decision-making process” and as a policy direction is a critical foundation for transportation programs that are facing significant capital renewal and preservation needs. The U.S. is clearly facing such a challenge.